Doctorate School PLUS

uni-salzburg.at/doktorat

PARIS LODRON UNIVERSITÄT SALZBURG

MARS

Models, Algorithms, Computers and Systems

Series of Talks
WS 2024/25

Start: 3 pm

Location: Lecture room 414, 1st floor
Hellbrunner Straße 34

A cooperation with SMC

Department of Mathematics
Department of Computer Science

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PARIS LODRON UNIVERSITÄT SALZBURG | Mathematics

PARIS LODRON UNIVERSITÄT SALZBURG | Computer Science

MARS – Models, Algorithms, Computers, and Systems

Modern high tech research in science and technology requires to a great extent an interdisciplinary approach. This applies particularly to wide areas of the methodological sciences mathematics and computer science, where generally one or more aspects of a chain of consecutive closely interlocked fields of research are considered. These start with a mathematical model, continue with algorithmic problems and finally cover aspects of the implementation on computers or high performance computing environments and therefore also issues on the efficiency of computer systems.

MARS is a doctoral programme at the Doctorate School PLUS (DSP Programme), which is organized by the departments of mathematics and computer sciences of the Paris Lodron University Salzburg. Its objective is to educate doctoral students in the research fields models, algorithms, computers, and systems and also to achieve new insights and research findings especially with regard to the inter-dependency of these fields of research. The focus will be on important topics relevant for the Salzburg research site. MARS fields of research form particularly from a methodological point a cohesive and closely linked line of research and cover a wide spectrum of scientific interests.

Joint activities constitute the structured doctoral program in MARS. These include seminars with external guest speakers, one day workshops with external guests and multi day retreats away from the university, as well as summer schools on the topics of MARS.

Program

October 10, 2024
Thursday, 15:00-15:45
Lecture room 414, 1st floor

Space-time goal-oriented a posteriori error control and adaptivity for discretization errors, iteration errors, and incremental POD-based ROM
Thomas Wick (Hannover LUH)

In this presentation, we discuss recent progress and ongoing open questions in space-time modeling, their space-time Galerkin finite element discretization and numerical solution of coupled problems.

Under the terminology coupled problems, we understand nonstationary, nonlinear, coupled PDE system and variational inequalities (CVIS). First, we have made progress in goal-oriented a posteriori error control and adaptivity with the dual-weighted residual method for incompressible flow (Navier-Stokes equations), fluid-structure interaction, and phase-field fracture.

In the second part, we extend those concepts to space-time goal-oriented model order reduction with incremental proper orthogonal decomposition with application to porous media problems, as for instance benchmarks such as Mandel's problem and a spatially three-dimensional footing problem.

Coming...